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$r=405464$ miles per hour, $a=6.532$ miles per hour, $d=47.0148$ miles per hour, $AB=13.4857$ miles, $AC=28.29$ miles, and $AD=76.17$ miles.

Similarly solved by *Professor G. B. M. ZERR*, and solved under a different interpretation by *P. S. BERG, J. F. W. SCHEFFER*, and *J. W. WATSON*.

17. Proposed by G. B. M. ZERR, A. M., Principal of High School, Staunton, Virginia.

A sum of P dollars is loaned at r per cent. interest. At the end of the first year a payment of x dollars is made; and at the end of each following year the payment is made greater by m per cent. than the preceding year. If the sum is paid in n payments, find x .

Solution by ALFRED HUME, C. E., D. Sc., Professor of Mathematics, University of Mississippi, University P. O., Mississippi.

Let $R=1+r$, $M=1+m$.

Amt. owed after 1st. payment $=PR-x$.

.. .. 2nd. .. $= (PR-x)R - xM = PR^2 - xR - xM$.

.. .. 3rd. .. $= PR^3 - xR^2 - xMR - xM^2$.

.. .. 4th. .. $= PR^4 - xR^3 - xMR^2 - xM^2R - xM^3$.

.....

.. .. n th. .. $= PR^n - x(R^{n-1} + MR^{n-2} + M^2R^{n-3} + \dots M^{n-2}R + M^{n-1})$.

If n payments cancel the debt, this $= 0$. The quantity in the parenthesis is a geometrical progression, the first term being R^{n-1} , the ratio $\frac{M}{R}$, the number of terms n .

$$\text{The sum is } \frac{R^{n-1} \left[\left(\frac{M}{R} \right)^n - 1 \right]}{\frac{M}{R} - 1} = \frac{M^n - R^n}{M - R}.$$

$$\therefore \frac{M^n - R^n}{M - R} x = PR^n,$$

$$\text{and } x = \frac{M - R}{M^n - R^n} PR^n = \frac{(m-r)(1+r)^n}{(1+m)^n - (1+r)^n} P.$$

Also solved by *Professors SCHEFFER, WHITAKER*, and *ZERR*.

18. Proposed by WILLIAM E. HEAL, Member of the London Mathematical Society, Marion, Indiana.

Two railroad trains, lengths m and n , meet at a siding, length l . How shall the trains pass if $l < m < n$?

Solution by W. H. CRALLE, Department of Mathematics, Hogsett Academy, Danville, Kentucky.

Divide train m into sections l or less in length, and with its engine pull its first section on siding; then let engine of n take its train beyond the switch, attach to next section of m and back it till rear of n clears the switch; then let engine of m pull its first section above the switch; then let n back on to switch and beyond, leaving second section of m on switch; next, let engine of n pull its train again beyond switch; then engine of m backs first section into switch and pulls off the second section. This operation is repeated $\frac{m}{l}$ times